Statistical Series **97-40**

EUB

Alberta's Energy Resources

1996 in Review

Alberta Energy and Utilities Board

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Conversion Factors Metric/Imperial Energy Equivalents

Almost all values used in *Alberta Energy Resources 1996 in Review* are metric. For Imperial units, use the conversions below:

Oil	1 cubic metre	= 6.293 barrels
Natural Gas	1 cubic metre	= 35.5 cubic feet
Coal	1 tonne	= 0.98 long ton (2240.6 lb or 1000 kg) = 1.1 short ton
Energy	1 petajoule Light Oil	= energy equivalent of 163 500 barrels
	1 petajoule Heavy Oil	= energy equivalent of 152 000 barrels
	1 petajoule Bitumen	= energy equivalent of 147 000 barrels
	1 petajoule Synthetic Crude Oil	= energy equivalent of 159 700 barrels
	1 petajoule Pentanes Plus	= energy equivalent of 190 100 barrels
	1 petajoule Ethane	= energy equivalent of 342 100 barrels
	1 petajoule Propane	= energy equivalent of 248 000 barrels
	1 petajoule Butane	= energy equivalent of 223 300 barrels
	1 petajoule Natural Gas	= energy equivalent of 904 600 000 cubic feet

Alberta's Energy Resources - 1996 in Review

This publication provides industry, media, government, the educational community, and the general public with an independent review of Alberta's energy resource activity in 1996. It includes charts, graphs, and maps showing year-end production, reserves, drilling activity, markets, and sales for Alberta's energy resources. It also documents production levels and markets for electric energy.

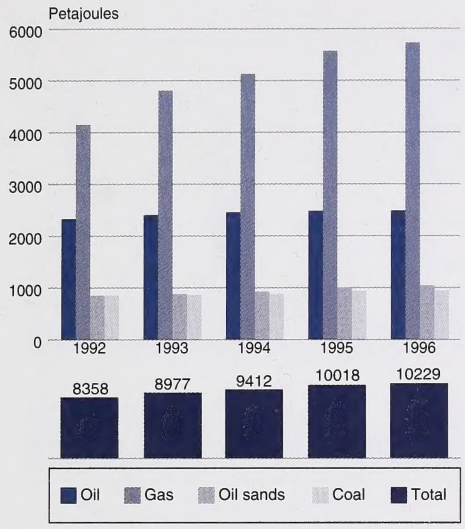
Alberta's energy resources sectors enjoyed a strong performance in 1996. Total hydrocarbon sales rose by 25 per cent to $26.27 billion, largely the result of resurgent oil and gas prices. Oil sands drilling doubled in 1996, over 1995, helping boost the overall number of oil and gas wells drilled to a record 10 396. At the same time, oil sands production rose 3.6 per cent to 25.8 million cubic metres, setting another record.

Alberta Hydrocarbon Production—An Overview

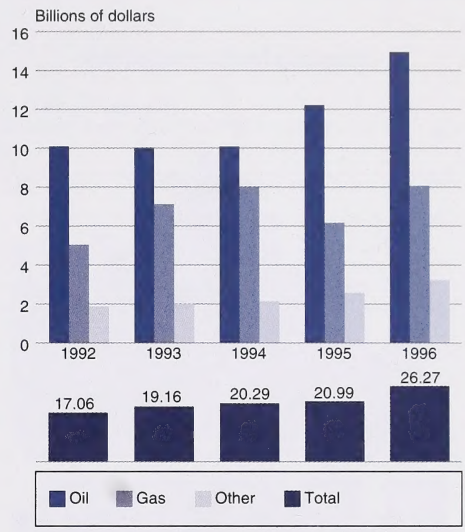
ALBERTA'S ENERGY RESOURCES — SUMMARY OF 1996 SALES

		To Alberta	To Other Provinces	Exports	Total
1996 Sales	Conventional Oil and Equivalent	894	819	1898	3611
(petajoules)	Natural Gas and Natural Gas Liquids	1057	1601	2864	5522
	Coal (Marketable)	475	26	291	792
	Hydro	6	0	0	6
	Total	2432	2446	5053	9931
	Per Cent of Sales	24	25	51	100

ALBERTA HYDROCARBON ENERGY PRODUCTION



GROSS REVENUE—ALL HYDROCARBONS



Total hydrocarbon production up slightly in 1996

Sustained activity levels in all Alberta energy resource sectors lifted total hydrocarbon production 2.1 per cent higher in 1996 over 1995. Once again, bitumen and synthetic crude oil led with a 4 per cent increase in production, followed by 2.8 per cent for gas and natural gas liquids. Coal production was up a percentage point, while conventional oil and pentane production was unchanged.

Alberta a net energy exporter

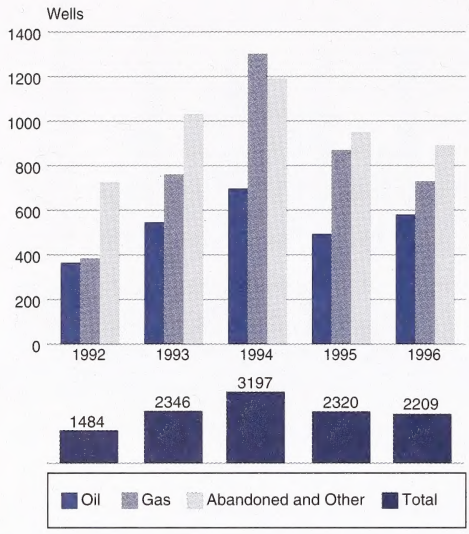
In 1996, exports accounted for just over half of all of Alberta's energy sales, with 53 per cent of conventional oil and 52 per cent of natural gas exported. In all, 75 per cent of conventional oil and 81 per cent of natural gas sales went to other provinces and export markets. By contrast, 60 per cent of Alberta's marketable coal and all the hydropower remained in the province to generate electricity.

Oil leads energy revenue surge

Fuelled by higher petroleum prices, sales of Alberta hydrocarbons and sulphur reached $26.27 billion in 1996, a 25-per-cent increase over 1995. Oil revenues led the way, jumping from $12.22 billion in 1995 to $14.95 billion in 1996, a rise of 22.4 per cent. Natural gas revenues rebounded from the previous year's dip, climbing from $6.18 billion in 1995 to $8.07 billion in 1996. Revenues from natural gas liquids increased by more than 35 per cent. In 1996, oil production accounted for 56.9 per cent of all energy sales, natural gas 30.7 per cent, and natural gas liquids, coal, and sulphur 12.3 per cent.

Oil, Gas, and Oil Sands Drilling Activity

OIL AND GAS WELLS—EXPLORATION

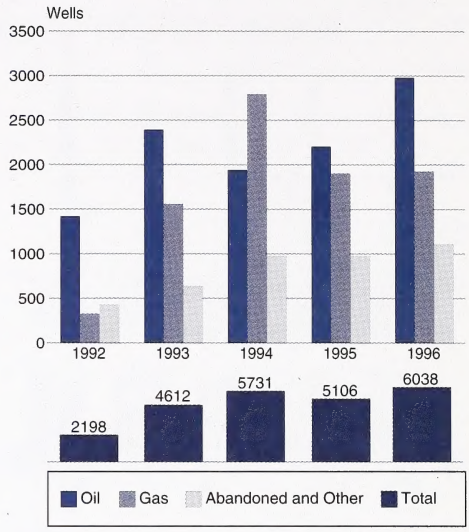


Drilling record set

Led by an upturn in oil sands and conventional oil development drilling, the total number of wells drilled in Alberta in 1996 reached a record 10 396, nearly 1300 more than the previous record year of 1994. More than 175 000 wells of all types have now been drilled in Alberta since well records began in 1902.

Oil sands drilling skyrocketed in 1996 to 2149 wells, a doubling of the 1995 total and a tenfold increase since 1994. The reasons for this rapid rise in drilling included a sharp increase in oil prices, lower costs of oil sands production, and the gradual decline in opportunities to discover light and medium crude oil. The oil sands drilling total comprised 1731 bitumen primary and commercial wells and 418 evaluation and experimental wells.

OIL AND GAS WELLS—DEVELOPMENT



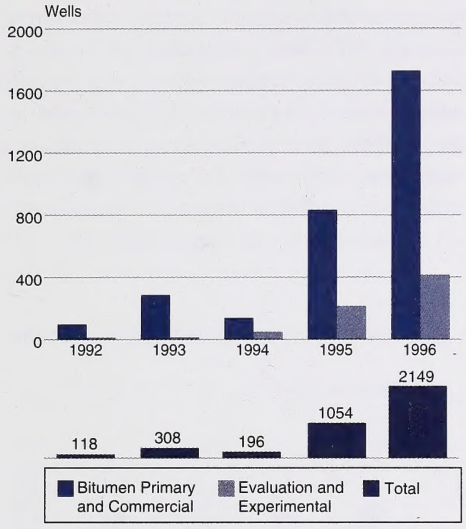
Development drilling in existing oil and gas fields also made significant gains, rising by 18 per cent to 6038 wells. Oil development drilling led the way, increasing from 2211 wells in 1995 to 2987 in 1996, while gas development drilling was up slightly to 1932 wells.

Conventional exploration drilling fell by 5 per cent to 2209 wells in 1996, following a 27-per-cent decline the previous year. A decrease in gas exploration more than offset an increase in oil exploration.

Well licences increase

The EUB issued 11 935 well licences in 1996, up from 9449 in 1995. About 85 per cent of licensed wells are drilled each year, thus the discrepancy between the number of licences and actual drilling activity. Licenced wells also include other drilling activity such as abandonment, disposal and injection wells.

OIL SANDS DRILLING



Active and capable wells

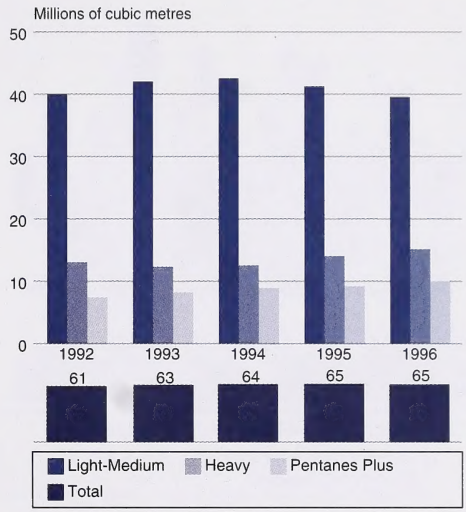
There were 47 351 capable oil, heavy oil, synthetic crude oil and crude bitumen wells in 1996, compared with 44 619 in 1995. The number of capable gas wells also rose, to 47 530 in 1996 from 45 021 the previous year.

Active wells are those showing production in a given month, but not all wells produce all the time. The average number of wells operating each month in 1996 totalled 31 002 oil and 36 940 gas wells. At the end of 1996, there were 8150 capped gas wells, down more than 500 from 1995.

Horizontal drilling gains strength

In 1996, the number of new wells using horizontal drilling rose by 33 per cent to 925, bringing the cumulative number of such wells to 2739 since the technique was introduced. Used primarily in heavy oil and oil sands deposits, horizontal drilling accounted for 9 per cent of all drilling activity in 1996.

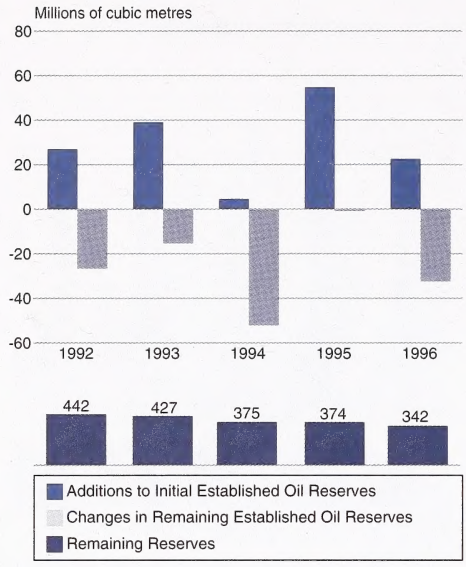
OIL AND PENTANES PLUS PRODUCTION



Conventional oil production down slightly

Alberta's production of conventional crude oil and pentanes plus—a light crude oil equivalent produced in association with natural gas—totalled 64.9 million cubic metres in 1996, virtually the same as the previous year. Production of light-medium oil fell by 4 per cent, while heavy oil and pentanes gained by 8 and 9 per cent respectively.

CHANGES IN RESERVES

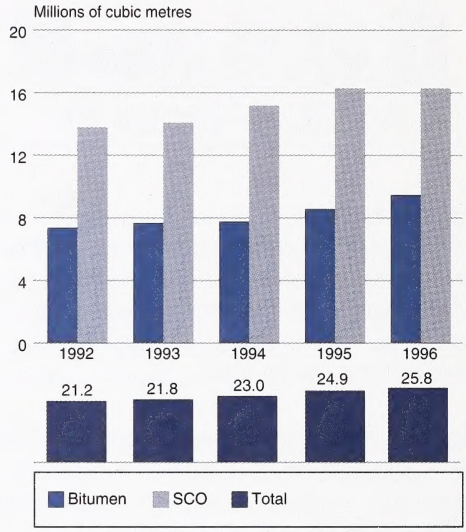


Conventional oil reserves continue to fall

In 1996, due to new discoveries, development of existing pools, and enhanced recoveries, industry activity added 32.1 million cubic meters to initial established reserves of conventional crude oil. The net reassessment of existing reserves totalled negative 9.5 million cubic meters bringing the total increase in Alberta's initial established reserves to 22.6 million cubic metres. But with production outstripping these additions, Alberta's remaining established reserves of conventional crude oil dipped by more than 8 per cent to 342 million cubic metres by year's end. Reasons for the decline included reduced well spacing and the use of new technologies such as horizontal drilling, which allowed reservoirs to be more rapidly depleted. Thus, following a 1995 in which net additions to reserves nearly equalled production, Alberta's established reserves resumed their steady decline in 1996.

Overall, conventional oil production has continued to outpace additions to reserves since production peaked in 1973. Nonetheless, exploratory and development drilling along with enhanced recovery methods still add to these reserves, thus extending the remaining years of conventional oil production. At the same time, synthetic crude oil production from oil sands continues to expand, filling the gap left by declining conventional oil reserves.

BITUMEN AND SYNTHETIC CRUDE OIL (SCO) PRODUCTION

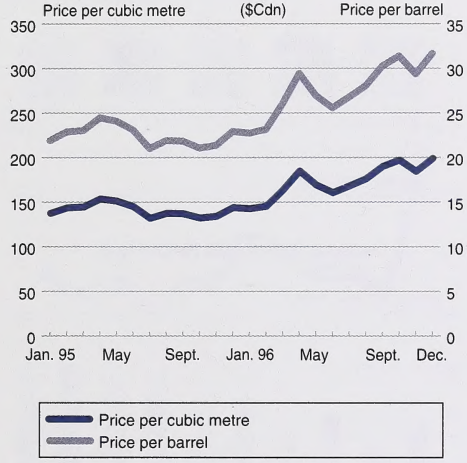


Another record year for oil sands

Once again, bitumen and synthetic crude oil production reached record levels in 1996. Production was up 3.6 per cent to 25.8 million cubic metres, continuing a steady upward trend of oil sand expansion. Bitumen production accounted for all of the gain, rising by 10.5 per cent, while synthetic production was unchanged. Oil from oil sands now accounts for nearly 31 per cent of Alberta's total oil production.

In 1996, initial established reserves of crude bitumen from deposits under active development increased slightly to 1035 million cubic metres. Of that total, 644 million cubic metres were from surface-mineable projects and 391 million cubic metres from in situ schemes. At year end, the remaining established reserves of crude bitumen from deposits under active development were 360 million cubic metres for mineable and 301 million for in situ projects.

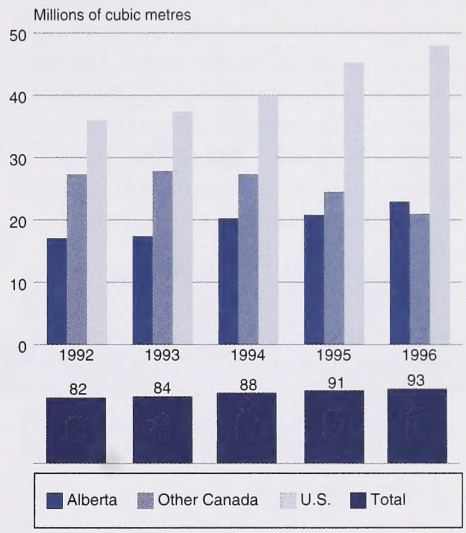
ALBERTA AVERAGE WEIGHTED FIELD PRICE FOR LIGHT OIL



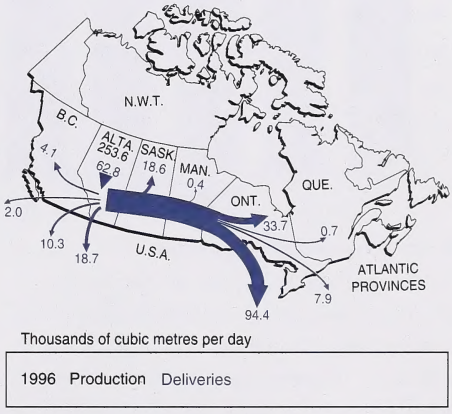
Average oil price jumps

The 1996 weighted Alberta field price for light and medium oil averaged $174 per cubic metre in Canadian dollars ($27.66 per barrel). This is the highest average price since 1985 and a 23-per-cent increase over the 1995 average price. The price increase helped push Alberta's overall hydrocarbon gross revenues to impressive levels in 1996 (see page 3).

MARKETS FOR OIL



DELIVERIES OF OIL



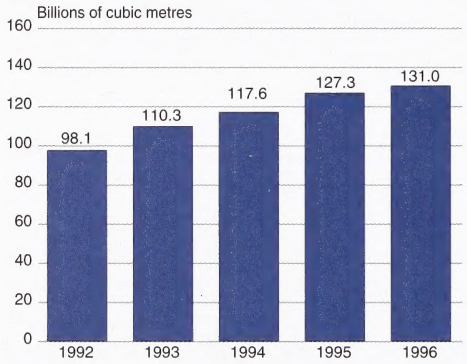
Oil deliveries rise slightly

Total deliveries of Alberta oil, including synthetic crude from oil sands production, grew by 1.9 per cent to 92.8 million cubic metres in 1996. The increase was led by a rise of 10.2 per cent within Alberta and 6 per cent to the United States. The only decline was in the rest of Canada, where

deliveries fell by 14.4 per cent. While offshore deliveries jumped by 143 per cent in 1996, they still accounted for less than one per cent of markets. By contrast, just over half of Alberta's total oil production went to the U.S. Midwest. One quarter stayed in Alberta for refining into other energy products, some of which were then exported. Of the other Canadian markets, Ontario and Saskatchewan accounted for the bulk of deliveries.

Natural Gas and Sulphur: Production, Reserves, Markets

GAS PRODUCTION



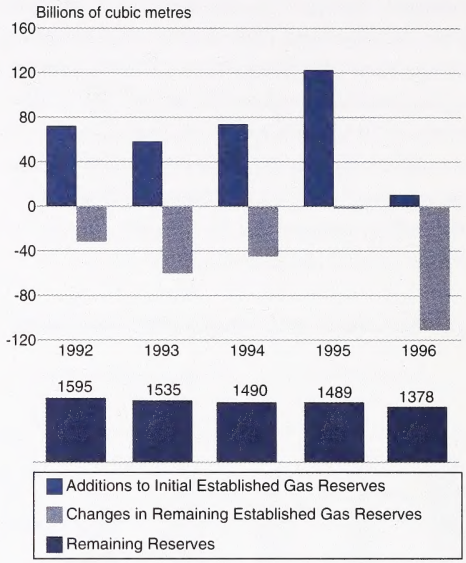
Natural gas production up slightly

Production of marketable natural gas rose to 131 billion cubic metres in 1996, setting yet another record. The increase of 2.9 per cent in production, however, represented a considerable slow down from the nearly 10-per-cent average growth over the previous four years.

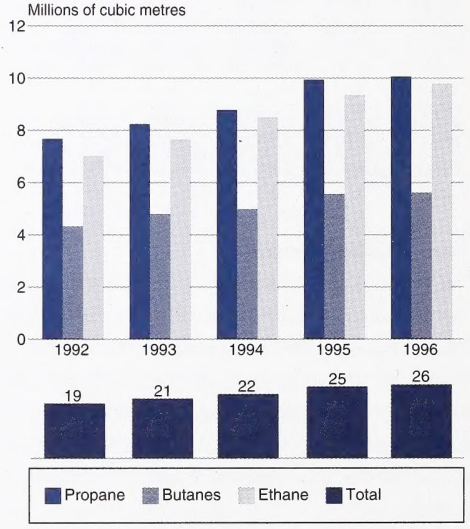
Gas reserves decline

Nearly 11 billion cubic metres of natural gas were added to Alberta's initial established reserves in 1996. But those additions were greatly outstripped by production, resulting in an overall decrease of 111 billion cubic metres, continuing a long-term reduction in established gas reserves. At the end of 1996, Alberta's remaining established reserves of natural gas stood at 1378 billion cubic metres.

GAS RESERVES



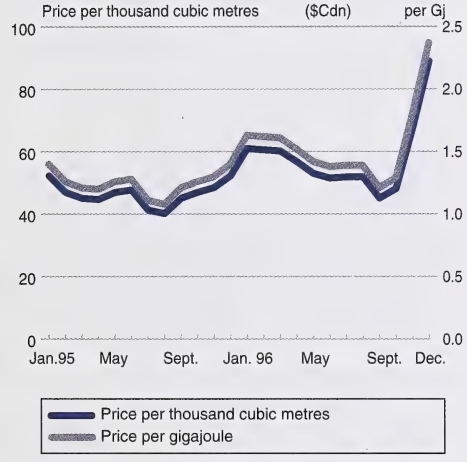
NATURAL GAS LIQUIDS PRODUCTION



Natural gas liquids production increases

The production of Alberta's natural gas liquids rose by 2.4 per cent to 25.5 million cubic metres in 1996, marking a slow down from the 9-per-cent average growth rate over the previous three years. Ethane production grew the most, increasing from 9.38 million cubic metres in 1995 to 9.81 million in 1996, while propanes and butanes posted slightly smaller gains. These natural gas liquids are used in petrochemicals, refining, and as energy sources. The production of another natural gas byproduct, pentanes plus, are included in crude oil production statistics (see page 5).

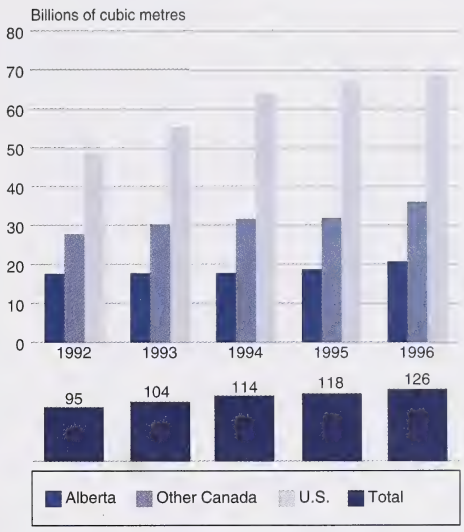
ALBERTA AVERAGE MARKET PRICE FOR GAS



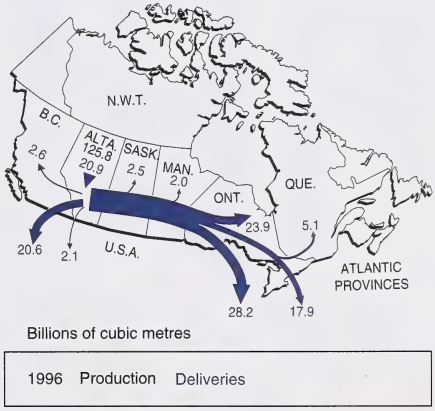
Average natural price rebounds in 1996

In 1996, the average market price for Alberta natural gas regained some lost ground from the previous year, increasing to $58.30 per thousand cubic metres in Canadian dollars ($1.54 per gigajoule). That marked a 24.6-per-cent rise over 1995, when the price plunged by 28 per cent. This strong performance was reflected in the improved gross revenue picture for Alberta hydrocarbons (see page 3).

MARKETS FOR GAS



DELIVERIES OF NATURAL GAS



Gas markets continue to expand

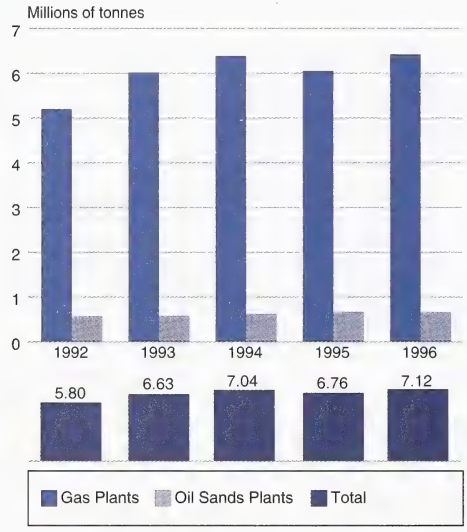
Alberta natural gas sales grew by 6.4 per cent in 1996 to 125.8 billion cubic metres. The bulk of that growth occurred within Canada; sales rose by 10.4 per cent in Alberta and 12.6 per cent in the rest of Canada. While U.S. growth was a more modest 2.3 per cent, that market still accounted for 55 per cent of Alberta's total natural gas sales.

Nearly 29 per cent of sales went to the rest of Canada, principally Ontario, for heating and petrochemical production, while just over 16 per cent stayed in Alberta for heating, petrochemical feedstock, and electricity production.

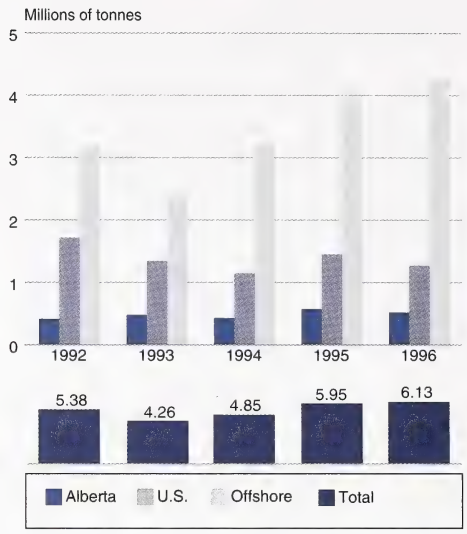
Sulphur markets continue to strengthen

Alberta produced 7.12 million tonnes of sulphur in 1996, a 5.4-per-cent increase over a poorer 1995 and the highest total ever, slightly surpassing the previous record of 7.1 million tonnes set in 1973. Gas processing plants continued to produce the vast bulk of sulphur — 6.4 million tonnes — distantly followed by oil sands plants and oil refineries.

SULPHUR PRODUCTION



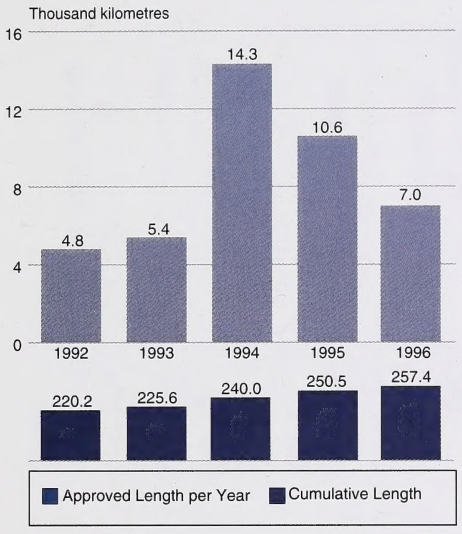
MARKETS FOR SULPHUR



In 1996, sulphur producers found markets for 6.1 million tonnes, or 86 per cent of the total produced. That represented a 2.9-per-cent increase in sales over 1995. Offshore customers in countries like Morocco, Brazil, South Africa, and Indonesia led the way with a 9.4-per-cent increase in purchases, offsetting declines of 12.3 per cent in the United States and 9.2 per cent in Alberta. Offshore markets accounted for more than 70 per cent of sales and U.S. markets for 21 per cent. Alberta producers rely heavily on export markets to absorb their large quantities of sulphur, which is removed from natural gas containing hydrogen sulphide.

Pipelines

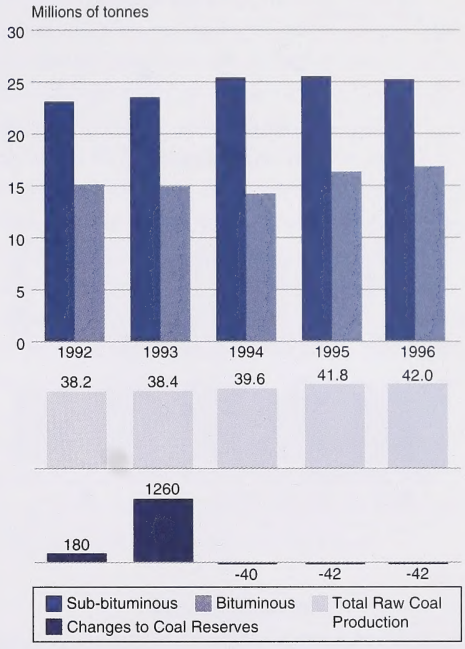
PIPELINE INSTALLED



Pipeline Construction Declines

In 1996, the EUB approved construction permits for 7050 kilometres of intra-Alberta pipelines, down 34 per cent from the previous year. These additions brought the total length of intra-Alberta pipelines to 257 450 kilometres. The Alberta portion of inter-provincial pipelines are regulated by the National Energy Board and are not included in these statistics.

COAL PRODUCTION AND RESERVES



Alberta's coal reserves fell by 42 million tonnes in 1996, the same rate of decline as in each of the two previous years. At year's end, total coal reserves stood at 35 billion tonnes. The long-term potential to expand those reserves, however, is tremendous since much of the province is underlain by coal deposits.

Coal

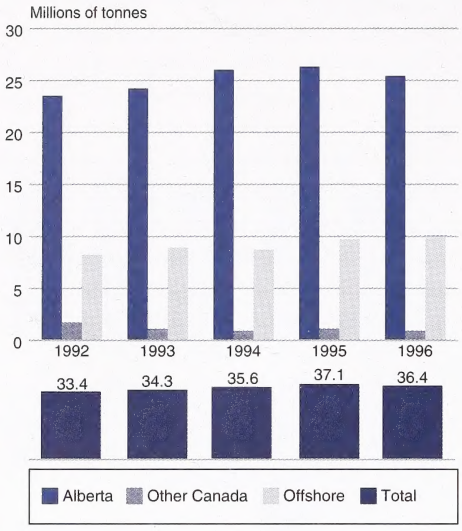
Coal production and reserves increase

Alberta's raw coal production in 1996 grew marginally to 42 million tonnes, continuing a trend in recent years of slow but steady expansion. Sixty per cent of that total was sub-bituminous coal, destined for Alberta's coal-fired power plants. The remainder was bituminous coal, much of it metallurgical and thermal supplies used to make steel and generate electricity overseas.

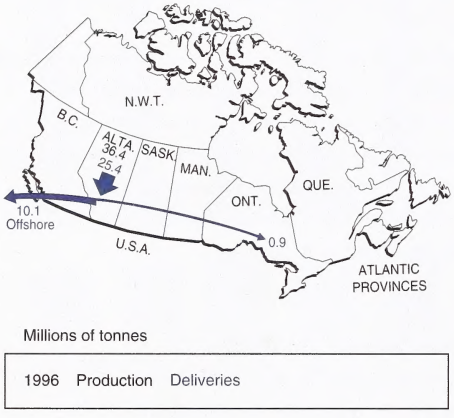
Coal deliveries slip slightly

Total deliveries of marketable coal in 1996 dipped by 1.9 per cent to 36.4 million tonnes. Nearly all markets were down, led by declines of 18 per cent in the rest of Canada, 3 per cent in Alberta, and 5 per cent in export markets other than Japan, including such countries as Korea, Brazil, and the United Kingdom. The one bright spot was Japan, which increased its imports of Alberta thermal coal by 10 per cent to 6.5 million tonnes. Power-generating plants within Alberta consumed

MARKETS FOR COAL



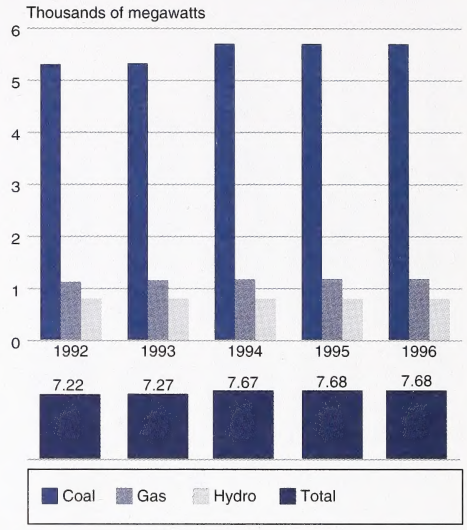
DELIVERIES OF COAL



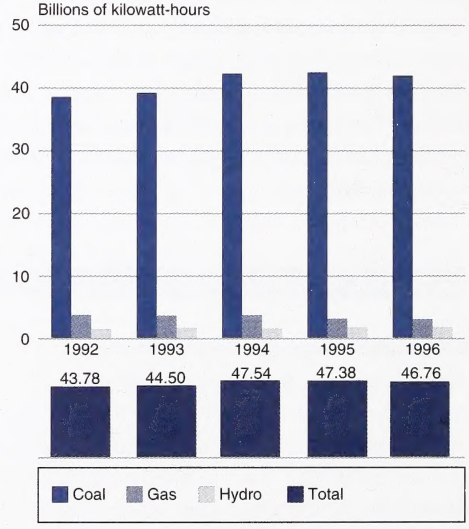
25.4 million tonnes of coal, mostly sub-bituminous grade in 1996, accounting for 70 per cent of the province's total marketable coal.

Electricity

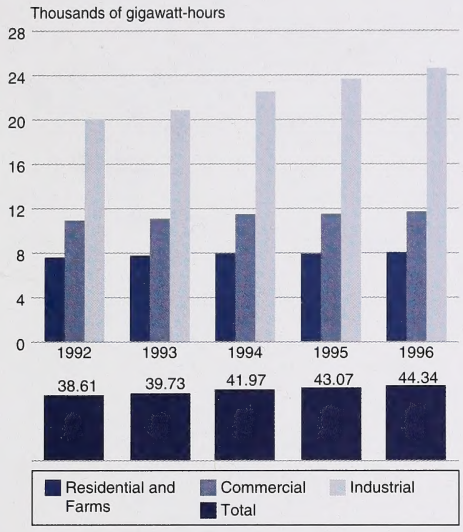
GENERATING CAPACITY



ELECTRICITY GENERATED



MARKETS FOR ELECTRICITY



Electric energy markets grow

In 1996, Alberta's electric generating capacity remained unchanged at 7.68 thousand megawatts. Generating capacity is always higher than demand to ensure reliability of supply for peak periods of electricity demand. Alberta's electric utilities generated 46.8 billion kilowatt hours of electricity in 1996, a fall of 1.3 per cent from 1995. Nearly 90 per cent of all the province's electricity was generated by coal-fired power plants, with gas and hydro accounting for 6.5 and 4 per cent respectively. Alberta's 1996 electric energy markets continued a recent trend of growth, increasing by 3 per cent to 44.3 thousand gigawatt hours. The greatest rise in demand came from the biggest electrical energy user, the industrial sector, which increased consumption by 4 per cent. This compared with increases of 1.8 per cent for commercial users and 1.5 per cent for residential and farm users.

Alberta in the Canadian Energy Picture

ALBERTA'S ENERGY RESOURCES — SUMMARY OF 1996 PRODUCTION AND RESERVES

		Alberta (petajoules)	Per cent of Canada	Total Canada (petajoules)
Remaining Reserves at the end of 1995	Conventional Oil and Pentanes	18 172	60	30 287
	Natural Gas and Natural Gas Liquids	66 685	82	81 323
	Bitumen	282 270	100	282 270
	Coal	692 600	63	1 099 365
	Total	1 059 727	71	1 493 245
1996 Production	Conventional Oil and Pentanes	2489	71	3520
	Natural Gas and NGLs	5731	80	7152
	Bitumen and Synthetic Crude Oil	1049	100	1049
	Coal	953	54	1780
	Hydro	6	1	1270
	Total	10 229	69	14 771

In 1996, Alberta accounted for 69 per cent of all the energy produced in Canada. The province produces 71 per cent of the nation's conventional oil and pentanes, 80 per cent of its natural gas and gas liquids, 54 per cent of its coal and all of its bitumen and synthetic crude. Alberta contains a similar share of Canada's remaining energy reserves — 60 per cent of conventional oil, 82 per cent of natural gas, 63 per cent of coal and 100 per cent of bitumen.

Our Mission

To ensure that development of Alberta's energy resources takes place in a responsible manner in the public interest and that Albertans receive safe and efficient utility service at rates that are fair and reasonable.

EUB Alberta Energy and Utilities Board

640 - 5 Avenue SW Calgary, Alberta T2P 3G4